

We venture to suggest that in these, and, indeed, in every other large school in England, a third, or Natural Science department should be founded, in which Practical Chemistry, Field Botany, and Natural Philosophy, with the French and German languages, should form the subjects of study. We are confident that in the hands of competent teachers, a lad might obtain between the ages of fifteen and eighteen or nineteen, a very large amount of useful knowledge on these subjects, without any undue strain upon his intellectual powers; while we are convinced that such a scheme would prove successful in a pecuniary point of view; and that there would be ample funds, derived from the scholars in attendance, to pay the additional teachers that would be required. The instruction given need only be rudimentary; but it should be most precise and thoroughly acquired. Any chemist could select six elements, any botanist six natural orders, any zoologist six classes of animals, which, if thoroughly known, would constitute an invaluable training to the future physician. He would then enter the medical school with a well-cultivated mind accustomed to close observation, and prepared to profit to the utmost by the system of education now generally adopted.

ORNITHOLOGY OF NEW ZEALAND

Catalogue of the Birds of New Zealand, with Diagnosis of the Species. By Frederick Wollaston Hutton, F.G.S., Assistant Geologist. Published by Command. 8vo. (New Zealand, 1871.)

A History of the Birds of New Zealand. By Walter Lawry Buller, D.Sc., F.L.S., C.M.Z.S., &c. Part I. 8vo, coloured plates. (London, 1872.)

BIRDS, as most people know, or ought to know, form the most important part of the vertebrate Fauna of New Zealand, and their importance is maintained not only when they are compared with their compatriots of other classes; but, when regarded in reference to members of their own class in the world at large, the birds of New Zealand offer so many singular forms that as a whole they deserve every consideration. Some of the most remarkable of these have already been mentioned by a distinguished writer in this periodical,* but perhaps hardly sufficient prominence was then given to the fact in the ornithology of New Zealand which seems of all others to demand attention; for, recent birds being divided into two great and trenchantly marked groups, of very unequal extent, the smaller of these groups (the *Ratitæ*) is found to contain six most natural sections, comprising, to take the most exaggerated estimate, less than two score of species, while the larger group (the *Carinatae*), though perhaps not containing more natural sections, comprehends some ten thousand species. Now, two out of the six sections of this small group are absolutely restricted to New Zealand, and these two sections contain considerably more than half of the species known to belong to it. Thus, setting aside the Carinate birds of our distant dependency (and some of them are sufficiently wonderful), its recent Ratite forms—some twenty species, let us say—alone may be regarded as the proportional equivalent of one-tenth of the birds of the globe, or numerically, we may say, of an avifauna of about one thousand species.

* NATURE, June 23, 1870, and Jan. 5, 1871.

The birds of New Zealand, therefore, merit especial attention, and we are happy to say they receive it at the hands of the authors whose works are above cited. Taking the field in or about the year 1865, Mr. Buller, till then unknown to fame beyond the limits of his native colony, brought out an "Essay on the Ornithology of New Zealand," which at once attracted notice in this old world of ours. Some of his views were challenged by Dr. Finsch, then of Leyden, who had paid attention to this extraordinary avifauna, and a controversy ensued. This, to the credit of the controversialists, was carried on in a spirit very different from that in which many another war in natural-history circles has been waged, and the happy result is that on most points the combatants have arrived at the same conclusion, thereby giving assurance to the general public of its being the right one. The Essay we have mentioned may be regarded as the preliminary canter which a race-horse takes before he puts forth his full strength; and Mr. Buller's book, or that part of it which is as yet published, shows what he can do now that the colonial authorities have allowed him to come to England for the express purpose of completing his design.

Captain Hutton is known as an observer who, during several long voyages, had proved that some rational occupation could be found at sea even by a landsman; for, instead of devoting his energies to the ordinary time-killing amusements of shipboard, he watched the flight of the various oceanic birds which presented themselves, and speculated on the mode in which it was performed and the forces it brought into operation—to some purpose as the Duke of Argyll and Dr. Pettigrew have testified. The pamphlet whose title we give is in some respects a not less significant, if a less ambitious, work than Mr. Buller's; and though to the last must belong the crown of glory, we by no means wish to overlook the useful part which Captain Hutton's publication will play. If here we do not notice it further, it is because its value will be most appreciated in the colony itself, while Mr. Buller's beautiful book appeals to a larger public.

Of the baker's dozen of species included in this first part of the "History of the Birds of New Zealand," we propose to notice only those belonging to three genera, two of them quite peculiar to the country, while the third is, or was, found in the neighbouring islands of the same zoo-geographical province. The remaining eight species belong to types of far wider distribution; hawks, owls, and kingfishers present much the same features all the world over, and the New Zealand parrakeets do not much differ from their congeners which are found in other portions of the Australian region.

The Kakapo, or Owl-parrot (*Strigops habroptilus*), is without doubt one of the most remarkable of New Zealand birds. It has already been figured in these columns;* but perhaps a few more words about it may not come amiss. Its crepuscular habits seem to have kept it hidden from the earlier explorers, and it was not until 1845 that this singular form was made known to naturalists by the late Mr. Gray. Possessing ample wings, it disdains their use; and to such an extent has this desuetude reached that its osteology is thereby materially affected, and it stands alone among Carinate birds as having the keel of its breast-bone dwarfed into a mere ridge, such as is

* NATURE, Jan. 5, 1871.

familiar to the anatomist as the attachment of an ordinary muscle, instead of the highly developed crest common to every other known Parrot. Prof. Huxley has even suggested a doubt whether its sternum is ossified as in other *Carinatae*; but this seems an excess of caution on his part, though we must admit that, until an investigator such as Mr. Parker has had the opportunity of examining an embryo, the question cannot be decided.

Of the Kakas (*Nestor*) Mr. Buller admits three species—*Nestor meridionalis*, *N. occidentalis*, and *N. notabilis*—the two first of which, we think, are barely separable. This very remarkable genus of Parrots includes some two or three other species, one of which, the *N. productus* of Phillip Island, is believed to have gone the way of so many animals that only inhabit small islands, and the same fate in all likelihood awaits its congeners. Most animals suffer from not being able to accommodate themselves to change of circumstances, but the very adaptability of the Mountain-Kaka, or Kea, will tend to its early destruction; for, though belonging to the groups of Parrots distinguished by their brush-like tongue, and deriving a considerable portion of their subsistence in a manner worthy of the Golden Age from the nectar of flowers, this wretched Kea (*N. notabilis*), since the introduction of sheep to New Zealand, has incurred the imputation of a fondness for mutton-cutlets à l'*Abyssinie**, and the charge, whether true or false, is likely to bring about its doom, since the shepherd is apt to practise what in good old times was called "border justice," and the species will probably suffer extinction before its guilt is fully proved or extenuating circumstances admitted. The Common Kaka (*N. meridionalis*), on the other hand, is ably defended by Mr. Buller as one of the most useful birds in the country; yet this also is rapidly diminishing. "In some districts," he says, "where in former years they were excessively abundant, their cry is now seldom or never heard," and though he adds that "in the wooded parts of the interior they are as plentiful as ever," it requires no prophetic eye to see that, with the extension of settlements, the Kaka must succumb.

The last bird we can especially mention is the Huia (*Heteralocha acutirostris*), known to our readers by a woodcut in these columns.† Mr. Buller, we must remark, has unhappily referred it to the Hoopoes (*Upupidae*) with which, so far as we can see, it has nothing in common. Mr. Garrod has lately informed the Zoological Society that it belongs to the Starlings (*Sturnidae*), and there can be little doubt that he is right in doing so; but it seems also to have some affinity to the Crows; and it is worthy of remark that one of its chief peculiarities, the diversity of the bill according to sex, is shared to some extent with an aberrant corvine form (*Nucifraga caryocatactes*). A distinguished zoologist has said that "such a divergence in the beak of the two sexes is very uncommon, and scarcely to be paralleled in the class of birds. It is difficult to guess at the reason of this, or to explain it on Darwinian or any other principles." Now, to us the difficulty does not seem greater than that presented by any other sexual characteristic, and on Darwinian principles the explanation is easy enough, if once the utility of the difference is established. This last is well shown by

Mr. Buller's remarks on a pair of caged Huia's which he kept for more than a year, and his account justifies the belief that had previously been entertained about them:—

"But what interested me most of all was the manner in which the birds assisted each other in their search for food, because it appeared to explain the use, in the economy of nature, of the differently formed bills in the two sexes. To divert the birds, I introduced a log of decayed wood infected with the huhu grub. They at once attacked it, carefully probing the softer parts with their bills, and then vigorously assailing them, scooping out the decayed wood till the larva or pupa was visible, when it was carefully drawn from its cell, treated in the way described above, and then swallowed. The very different development of the mandibles in the two sexes enabled them to perform separate offices. The male always attacked the more decayed portions of the wood, chiselling out his prey after the manner of some Woodpeckers, while the female probed with her long pliant bill the other cells, where the hardness of the surrounding parts resisted the chisel of her mate. Sometimes I observed the male remove the decayed portion without being able to reach the grub, when the female would at once come to his aid, and accomplish with her slender bill what he had failed to do. I noticed, however, that the female always appropriated to her own use the morsels thus obtained."

Here we must pause. Mr. Buller's book is in every way worthy of its subject, and we trust that we have shown that the subject is worthy of close attention—whether we regard the various forms of New Zealand birds from the point of view of their intrinsic interest, or from that of so many being now on the verge of extinction. It is easy to be wise after the event, and ornithologists at home do not in these days look back affectionately towards their predecessors who have let so many species pass away without tracing the process of extermination. We have above hinted at some of the causes of extinction which seem to be at work; and most of them, it is to be feared, are insuperable: but there is another, and possibly more powerful cause which is entirely under control. This is the silly mania for "acclimatisation" which has been so warmly fostered by many well-meaning though ill-advised persons, both at home and in the colonies, and nowhere more than in New Zealand. The English Acclimatisation Society fortunately came to an end, and before it had time to do any harm here; but its example has been mischievous in our dependencies. In a reckless way animals of extremely doubtful advantage have been transported to the antipodes, and there it seems impossible to deny that they will in a few years be found not only ousting the kinds which are less specialised, and therefore less able to meet them on an equal footing; but, unaccompanied by any of those checks which keep the whole of a natural fauna balanced, the importations will inevitably become the greatest of nuisances. The memory of the patriotic Scot who could not live without his thistles is not exactly blessed by Australians, and among the pilgrim fathers of New Zealand who will ultimately obtain an apotheosis, the members of their various acclimatisation societies will, we suspect, scarcely be reckoned.

* NATURE, Oct. 19, 1871, and Feb. 1, 1872.

† NATURE, June 23, 1870.